

**Notice of Allowability**

Application No.

10/665,998

Examiner

Eric B. Chen

Applicant(s)

SCHAADT ET AL.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 3/11/05.
2. ☒ The allowed claim(s) is/are 1-91 and 98-106.
3. ☒ The drawings filed on 9/17/03 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All    b) ☐ Some\*    c) ☐ None    of the:
  1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  6. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08),  
Paper No./Mail Date 4/4/05
4. ☐ Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

**NADINE G. NORTON**  
**SUPERVISORY PATENT EXAMINER**

*Nadine G. Norton*

### **EXAMINER'S AMENDMENT**

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.
2. Authorization for this examiner's amendment was given in a telephone interview with Gregory R. Muir on May 9, 2005.
3. The application has been amended as follows: claims 92-97 are cancelled.

### ***Allowable Subject Matter***

4. Claims 1-92 and 98-106 are allowed.
5. The following is an examiner's statement of reasons for allowance for claims 1 and 98: the prior art fails to teach or suggest pumping a portion of the gas out from the etching chamber, wherein the gas comprises a portion of the etchant recipe and a portion of the etching product; and wherein another portion of the first amount of the etchant recipe is circulated in a circulation loop that passes through the etching chamber during the steps of pumping and providing the second discrete amount of the etchant recipe. The closest prior art, Tai, discloses: loading a microstructure (column 6, lines 59-60) into an etch chamber (110) (column 6, line 29), wherein the microstructure comprises a sacrificial material (column 6, lines 64-67) and one or more structural materials (column 6, line 29); providing a first discrete amount of spontaneous

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vapor phase etchant recipe (column 5, lines 42-45) during a first feeding cycle of a sequence of feeding cycles for removing the sacrificial material (column 5, lines 56-67; column 6, lines 1-5; Figure 1B); pumping a portion of the gas from the etching chamber (column 5, lines 51-53); providing a second discrete amount of spontaneous vapor phase etchant recipe after the first feeding cycle and during a second feeding cycle that follows the first feeding cycle of the sequence of feeding cycles for removing the sacrificial materials (column 6, lines 4-5; column 7, lines 11-14; Figure 5). However, there is no motivation or suggestion of pumping a portion of the gas out from the etching chamber, wherein the gas comprises a portion of the etchant recipe and a portion of the etching product; and wherein another portion of the first amount of the etchant recipe is circulated in a circulation loop that passes through the etching chamber during the steps of pumping and providing the second discrete amount of the etchant recipe, as in the context of claims 1 and 98.

6. The following is an examiner's statement of reasons for allowance for claim 45: the prior art fails to teach or suggest circulating the etchant and the diluent gas through a circulation loop that passes through the etch chamber. The closest prior art, Tai, discloses: (a) establishing a first pressure inside a first chamber (120) (column 4, lines 24-27), wherein the first pressure is equal to or lower than a pressure in a second chamber that contains a spontaneous vapor phase etchant ( $\text{BrF}_3$  source, Figure 1A); (b) filling the first chamber (120) with an etchant (column 5, lines 42-45); (c) filling the first chamber (120) with a diluent gas such that the pressure inside the first chamber reaches a second pressure that is higher than the first pressure (column 4, lines 50-52);

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(d) circulating the etchant and the diluent gas through the etch chamber (column 5, lines 48-55). However, there is no motivation or suggestion of circulating the etchant and the diluent gas through a circulation loop that passes through the etch chamber, as in the context of claim 45.

7. The following is an examiner's statement of reasons for allowance for claim 72: the prior art fails to teach or suggest circulating a first amount of spontaneous vapor phase etchant recipe via a first loop that passes through the etch chamber for removing the sacrificial material, as in the context of claim 72. The closest prior art, Tai, discloses: loading a microstructure (column 6, lines 59-60) into an etch chamber (110) (column 6, line 29), wherein the microstructure comprises a sacrificial material (column 6, lines 64-67) and one or more structural materials (column 6, line 29). However, there is no motivation or suggestion of circulating a first amount of spontaneous vapor phase etchant recipe via a first loop that passes through the etch chamber for removing the sacrificial material, as in the context of claim 72.

8. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Response to Arguments***

9. In view of Applicants' Amendment to the Claims (pages 6 and 21), filed Mar. 11, 2005, the objection to claims 27 and 58 has been withdrawn.

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10. Applicant's arguments (Applicants' Remarks, page 17), filed Mar. 11, 2005, with respect to the rejection of claim 1 under 35 U.S.C. 102(b) as being anticipated by Tai have been fully considered and are persuasive, as discussed above. The rejection of claims 1-44 has been withdrawn.

11. Applicant's arguments (Applicants' Remarks, page 17), filed Mar. 11, 2005, with respect to the rejection of claim 45 under 35 U.S.C. 102(b) as being anticipated by Tai have been fully considered and are persuasive, as discussed above. The rejection of claims 45-71 has been withdrawn.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric B. Chen whose telephone number is (571) 272-2947. The examiner can normally be reached on Monday through Friday, 8AM to 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine G. Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

EBC

May 9, 2005

EBC

NADINE G. NORTON  
SUPERVISORY PATENT EXAMINER